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CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8) Applicant(s): Morton et al.			Docket No. 2003-0058-01
Application No. 10/672,182	Filing Date Sept. 26, 2003	Examiner P. Nguyen	Group Art Unit 2828

Invention: ELECTRODES FOR FLUORINE GAS DISCHARGE LASERS

Conf. No. 9850

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USSN 10/672,182
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Morton et al.

Serial No.: 10/672,182

Filing Date: September 26, 2003

Title: ELECTRODES FOR FLUORINE GAS DISCHARGE LASERS

Examiner: P. Nguyen

Group Art Unit: 2828

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APPLICANT'S APPEAL BRIEF

In response to a Final Office Action mailed September 7, 2006, Applicants submitted a Notice of Appeal in the above captioned application on December 7, 2006. Applicants hereby present Applicants' Appeal Brief.

(1) Real Party In Interest

The real party in interest in the above captioned application is Cymer, Inc. a corporation of the State of Nevada and the assignee of the above captioned application from the applicants, the named inventors.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of the Claims

Claims 1-78 are pending in this application, with claims 1-14 and 51-78 withdrawn from consideration. Accordingly, claims 15-50 of the above-captioned patent application are active and pending.

(4) Status of Amendments

There have been no amendments filed after the September 7, 2006 Final Office Action.

(5) Summary of Claimed Subject Matter

As currently pending, claim 15 relates to a gas discharge laser having a laser gas containing fluorine. The gas discharge laser has an elongated gas discharge electrode with an elongated electrode body having a centerline axis, a pair of side walls on either side of the centerline axis, and a pair of end walls transverse to the centerline axis. The gas discharge laser has a crown straddling the centerline axis between the pair of side walls and the pair of end walls, comprised of a first material, forming at least a portion of the discharge region of the electrode. A pair of elongated high erosion regions on either side of the crown are comprised of a second material with a relatively higher erosion rate during gas discharge than that of the first material.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 15-38 and 43-46 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,810,061 to Hori et al.

Claims 39-42 and 47-50 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(7) Argument

(A) Rejection under 35 USC §102(e) over U.S. Patent 6,810,061

The Examiner has rejected claims 15-38 and 43-46 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,810,061 to Hori et al. (hereinafter, *Hori*).

The Examiner's rejection rests on his assertion that Applicants above-captioned patent application is a continuation-in-part of at least two other earlier patent applications: U.S. Patent Application No. 10/081,589 filed February 21, 2002 and U.S. Patent Application No. 10/104,502 filed March 22, 2002 (parent cases). The Examiner acknowledges that both of the patent applications, from which Applicants claim priority from, have earlier dates as compared to *Hori*.

The Examiner has indicated that the parent cases do not disclose the claimed "gas discharge laser with a crown straddling the centerline axis between the pair of side walls and the pair of endwalls, comprising first material, forming at least a portion of the discharge region of the electrode and a pair of elongated high erosion regions on either side of the crown comprising a second material." The Examiner has further indicated that that the claims "are not enabled by the parent applications, and are not entitled to the filing date of the parent application." The Examiner has thus indicated that the effective date of the above-captioned patent application is September 26, 2003, which is the filing date of the application. Applicants respectfully traverse this rejection.

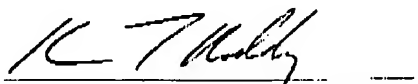
Applicants' independent claim 15 relates to a gas discharge laser having a laser gas containing fluorine. The gas discharge laser has an elongated gas discharge electrode with an elongated electrode body having a centerline axis, a pair of side walls on either side of the centerline axis, and a pair of end walls transverse to the centerline axis. The gas discharge laser has a crown straddling the centerline axis between the pair of side walls and the pair of end walls, comprised of a first material, forming at least a portion of the discharge region of the electrode. A pair of elongated high erosion regions on either side of the crown are comprised of a second material with a relatively higher erosion rate during gas discharge than that of the first material.

Applicants submit that the features of independent claim 15 are supported, *e.g.*, by at least by Applicants' U.S. Patent Application No. 10/104,502, now U.S. Patent No. 6,690,706 (hereinafter, the *'706 patent*), from which Applicants have claimed priority. Applicants submit that the features of independent claim 15 are at least supported, *e.g.*, by the abstract, 3:5-23, 10:6-34, and FIGS. 7C, 7D, and 7F of the *'706 patent*. Accordingly, Applicants submit that they at least are entitled to rely on this earlier-filed application to establish a priority before August 22, 2002, the applicable date of *Hori*. Reconsideration and withdrawal of the 35 U.S.C. § 102(e) rejections of claims 15-38 and 43-46 are respectfully requested.

Conclusion

In view of the above remarks and arguments, Appellant believes that the imposed rejections of all remaining pending claims are unsupported in law and fact and reversal of such is respectfully requested. The Commissioner is hereby authorized to charge the deposit account of applicants' assignee, Cymer, Inc., Deposit Account No. 03-4060 in the amount of $500.00 for the filing of the Applicants' Appeal Brief. Applicants do not believe that any additional fees or charges are due for the prosecution of this appeal, however, in the event that there are, the Commissioner is authorized to charge any such additional fees or charges to the noted Deposit Account.

Respectfully submitted,



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(8)
Claims Appendix
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1. (Withdrawn) A gas discharge laser having a laser gas containing fluorine comprising:

a first and a second elongated gas discharge electrode;

the first and the second elongated gas discharge electrodes facing each other to form a gas discharge region between the first and the second elongated gas discharge electrodes:

the first elongated gas discharge electrode connected to a voltage and insulatedly mounted to a housing wall, the housing wall being at a common potential;

the second elongated gas discharge electrode being at the common potential mounted on a second elongated gas discharge electrode mounting member; and,

a plurality of current return tangs connected between the housing wall and the second elongated gas discharge electrode mounting member along a longitudinal length of the first and second elongated gas discharge electrodes extending for less than the respective length of the second elongated gas discharge electrode.

2. (Withdrawn) The apparatus of claim 1 further comprising:

the extension of the plurality of current return tangs along the respective length of the second gas discharge electrode is terminated sufficiently far from the ends of the second elongated gas discharge electrode to prevent differentially faster erosion of the respective first and second elongated gas discharge electrodes in comparison to the remainder of the respective first and second elongated gas discharge electrodes.

3. (Withdrawn) The apparatus of claim 1 further comprising:

the extension of the plurality of current return tangs along the respective length of the second gas discharge electrode is terminated sufficiently far from the respective end of the second elongated gas discharge electrode to modify the inductance influence on the electric fields generated between the first and second elongated gas discharge electrodes in the region of the respective end of the second elongated gas discharge electrode,

thereby modifying the shape of the discharge in the region of the end of the second elongated gas discharge electrode.

4. (Withdrawn) The apparatus of claim 1 further comprising:

the first current return tang being positioned along the longitudinal axis of the second gas discharge electrode just beyond the point where expanded gas discharge erosion is observed in a system without removal of any of the current return tangs.

5. (Withdrawn) The apparatus of claim 2 further comprising:

the first current return tang being positioned along the longitudinal axis of the second gas discharge electrode just beyond the point where expanded gas discharge erosion is observed in a system without removal of any of the current return tangs.

6. (Withdrawn) The apparatus of claim 2 further comprising:

the first current return tang being positioned along the longitudinal axis of the second gas discharge electrode just beyond the point where expanded gas discharge erosion is observed in a system without removal of any of the current return tangs.

7. (Withdrawn) A gas discharge laser comprising:

a first elongated gas discharge electrode;

a second elongated gas discharge electrode;

the first and second elongated gas discharge electrodes oppositely facing each other forming a gas discharge region between the first and the second elongated gas discharge electrodes;

a discharge power supply connected across the first and second elongated gas discharge electrodes periodically providing a discharge voltage to create a gas discharge in the gas discharge region;

a first discharge shaping magnet mounted in the first elongated gas discharge electrode; and,

a second discharge shaping magnet mounted in the second elongated gas discharge electrode.

8. (Withdrawn) The apparatus of claim 7 further comprising:

the first discharge shaping magnet mounted transversely to the gas discharge region with a first pole facing one side of the gas discharge region; and,

the second discharge shaping magnet mounted transversely to the gas discharge region with a second opposite pole facing the one side of the gas discharge region.

9. (Withdrawn) The apparatus of claim 7 further comprising:

at least one of the first and second discharge shaping magnets is a rare earth magnet.

10. (Withdrawn) The apparatus of claim 8 further comprising:

at least one of the first and second discharge shaping magnets is a rare earth magnet.

11. (Withdrawn) The apparatus of claim 7 further comprising:

at least one of the first and second gas discharge electrodes has imbedded therein a first and a second auxiliary field creating magnet.

12. (Withdrawn) The apparatus of claim 8 further comprising:

at least one of the first and second gas discharge electrodes has imbedded therein a first and a second auxiliary field creating magnet.

13. (Withdrawn) The apparatus of claim 9 further comprising:

at least one of the first and second gas discharge electrodes has imbedded therein a first and a second auxiliary field creating magnet.

14. (Withdrawn) The apparatus of claim 10 further comprising:

at least one of the first and second gas discharge electrodes has imbedded therein a first and a second auxiliary field creating magnet.

15. (previously presented) A gas discharge laser comprising a laser gas containing fluorine, comprising:

an elongated gas discharge electrode comprising:

an elongated electrode body having a centerline axis;

a pair of side walls on either side of the centerline axis;

a pair of end walls transverse to the centerline axis;

a crown straddling the centerline axis between the pair of side walls and the pair of end walls, comprising a first material, forming at least a portion of the discharge region of the electrode;

a pair of elongated high erosion regions on either side of the crown comprising a second material with a relatively higher erosion rate during gas discharge than that of the first material.

16. (previously presented) The apparatus of claim 15 further comprising:

the second material is chose from a group of high erosion rate alloys.

17. (previously presented) The apparatus of claim 15 further comprising:

the second material is chosen from a group including materials comprising high zinc alloys, high tin alloys, glidcop, indium and aluminum.

18. (previously presented) The apparatus of claim 16 further comprising:

the second material is chosen from a group including materials comprising high zinc alloys, high tin alloys, glidcop, indium and aluminum.

19. (previously presented) The apparatus of claim 15 further comprising:

the first material comprising copper or copper alloy.

20. (previously presented) The apparatus of claim 16 further comprising:

the first material comprising copper or copper alloy.

21. (previously presented) The apparatus of claim 17 further comprising:

the first material comprising copper or copper alloy.

22. (previously presented) The apparatus of claim 18 further comprising:

the first material comprising copper or copper alloy.

23. (previously presented) The apparatus of claim 19 further comprising:

the first material is bonded to the second material by a process that creates a differential composition but single piece material.

24. (previously presented) The apparatus of claim 20 further comprising:

the first material is bonded to the second material by a process that creates a differential composition but single piece material.

25. (previously presented) The apparatus of claim 21 further comprising:

the first material is bonded to the second material by a process that creates a differential composition but single piece material.

26. (previously presented) The apparatus of claim 22 further comprising:

the first material is bonded to the second material by a process that creates a differential composition but single piece material.

27. (previously presented) The apparatus of claims 23 further comprising:

the first material is bonded t the second material by a process selected from the group of diffusing bonding, explosion bonding, cladding, ultrasonic welding and galvanizing.

28. (previously presented) The apparatus of claims 24 further comprising:

the first material is bonded t the second material by a process selected from the group of diffusing bonding, explosion bonding, cladding, ultrasonic welding and galvanizing.

29. (previously presented) The apparatus of claims 25 further comprising:

the first material is bonded t the second material by a process selected from the group of diffusing bonding, explosion bonding, cladding, ultrasonic welding and galvanizing.

30. (previously presented) The apparatus of claims 26 further comprising:

the first material is bonded t the second material by a process selected from the group of diffusing bonding, explosion bonding, cladding, ultrasonic welding and galvanizing.

31. (previously presented) The apparatus of claim 19 further comprising:

the high erosion regions are formed by creating a channel on either side of the crown and filling each channel with a molten form of the second material and machining the shape of the second material after it hardens.

32. (previously presented) The apparatus of claim 20 further comprising:

the high erosion regions are formed by creating a channel on either side of the crown and filling each channel with a molten form of the second material and machining the shape of the second material after it hardens.

33. (previously presented) The apparatus of claim 21 further comprising:

the high erosion regions are formed by creating a channel on either side of the crown and filling each channel with a molten form of the second material and machining the shape of the second material after it hardens.

34. (previously presented) The apparatus of claim 22 further comprising:

the high erosion regions are formed by creating a channel on either side of the crown and filling each channel with a molten form of the second material and machining the shape of the second material after it hardens.

35. (previously presented) The apparatus of claim 19 further comprising:

the high erosion regions comprise an annealed brass allow with a high zinc content.

36. (previously presented) The apparatus of claim 20 further comprising:

the high erosion regions comprise an annealed brass allow with a high zinc content.

37. (previously presented) The apparatus of claim 21 further comprising:

the high erosion regions comprise an annealed brass allow with a high zinc content.

38. (previously presented) The apparatus of claim 22 further comprising:

the high erosion regions comprise an annealed brass allow with a high zinc content.

39. (previously presented) The apparatus of claim 35 further comprising:

the annealed brass alloy is chosen from the group comprising:

C26000, C27000 and C28000.

40. (previously presented) The apparatus of claim 36 further comprising:

the annealed brass alloy is chosen from the group comprising:

C26000, C27000 and C28000.

41. (previously presented) The apparatus of claim 37 further comprising:

the annealed brass alloy is chosen from the group comprising:

C26000, C27000 and C28000.

42. (previously presented) The apparatus of claim 38 further comprising:

the annealed brass alloy is chosen from the group comprising:

C26000, C27000 and C28000.

43. (previously presented) The apparatus of claim 35 further comprising:

the annealed brass alloy is annealed at temperatures in excess of 1200F.

44. (previously presented) The apparatus of claim 36 further comprising:

the annealed brass alloy is annealed at temperatures in excess of 1200F.

45. (previously presented) The apparatus of claim 37 further comprising:

the annealed brass alloy is annealed at temperatures in excess of 1200F.

46. (previously presented) The apparatus of claim 38 further comprising:

the annealed brass alloy is annealed at temperatures in excess of 1200F.

47. (previously presented) The apparatus of claim 35 further comprising:

the annealed brass alloy comprises:

a thin film of zinc on the surface of the annealed brass alloy.

48. (previously presented) The apparatus of claim 36 further comprising:

the annealed brass alloy comprises:

a thin film of zinc on the surface of the annealed brass alloy.

49. (previously presented) The apparatus of claim 37 further comprising:

the annealed brass alloy comprises:

a thin film of zinc on the surface of the annealed brass alloy.

50. (previously presented) The apparatus of claim 38 further comprising:

the annealed brass alloy comprises:

a thin film of zinc on the surface of the annealed brass alloy.

51. (Withdrawn) A laser electrode comprising:

an electrode body comprising an electrically conductive material having a first coefficient of thermal conductivity;

a first insert in the electrode body comprising an electrically conductive material having a second coefficient of thermal conductivity;

the second coefficient of thermal conductivity being substantially greater than the first coefficient of thermal conductivity.

52. (Withdrawn) The apparatus of claim 51 further comprising:

the first insert forming a discharge footprint on the electrode surface facing an opposed electrode.

53. (Withdrawn) The apparatus of claim 51 further comprising:

a second insert contained within the electrode body in thermal conductivity communication with the first insert, the second insert comprising a substantial portion of the interior of the electrode body but less than about fifty percent.

54. (Withdrawn) The apparatus of claim 53 further comprising:

a second insert contained within the electrode body in thermal conductivity communication with the first insert, the second insert comprising a substantial portion of the interior of the electrode body but less than about fifty percent.

55. (Withdrawn) The apparatus of claim 53 further comprising:

the second insert being rectilinear in cross section.

56. (Withdrawn) The apparatus of claim 54 further comprising:

the second insert being rectilinear in cross section.

57. (Withdrawn) The apparatus of claim 51 further comprising:

a second insert contained within the electrode body in thermal conductivity communication with the first insert, the second insert comprising substantially all of the interior of the electrode body.

58. (Withdrawn) The apparatus of claim 52 further comprising:

a second insert contained within the electrode body in thermal conductivity communication with the first insert, the second insert comprising substantially all of the interior of the electrode body.

59. (Withdrawn) The apparatus of claim 57 further comprising:

the second insert having a shape that substantially matches that of the electrode body.

60. (Withdrawn) The apparatus of claim 58 further comprising:

the second insert having a shape that substantially matches that of the electrode body.

61. (Withdrawn) The apparatus of claim 51 further comprising:

the electrode body and the first insert are molecularly bonded.

62. (Withdrawn) The apparatus of claim 52 further comprising:

the electrode body and the first insert are molecularly bonded.

63. (Withdrawn) The apparatus of claim 53 further comprising:

the electrode body and the first and second inserts are molecularly bonded.

64. (Withdrawn) The apparatus of claim 54 further comprising:

the electrode body and the first and second inserts are molecularly bonded.

65. (Withdrawn) The apparatus of claim 55 further comprising:

the electrode body and the first and second inserts are molecularly bonded.

66. (Withdrawn) The apparatus of claim 52 further comprising:

the electrode body and the first and second inserts are diffusion bonded.

67. (Withdrawn) The apparatus of claim 53 further comprising:

the electrode body and the first and second inserts are diffusion bonded.

68. (Withdrawn) The apparatus of claim 54 further comprising:

the electrode body and the first and second inserts are diffusion bonded.

69. (Withdrawn) The apparatus of claim 55 further comprising:

the electrode body and the first and second inserts are diffusion bonded.

70. (Withdrawn) The apparatus of claim 52 further comprising:

the electrode body and the first and second inserts are diffusion bonded.

71. (Withdrawn) A gas discharge laser having a laser gas containing fluorine, comprising:

a gas discharge electrode comprising:

a thin film of semi-conductive material coating at least the discharge footprint of the gas discharge electrode.

72. (Withdrawn) The apparatus of claim 71 further comprising:

the semi-conductive material is a metallic oxide.

73. (Withdrawn) The apparatus of claim 72 further comprising:

the metallic oxide is one selected from the group of zinc oxide, lead oxide and Sn02.

74. (Withdrawn) A method of forming bi-metallic fluorine gas discharge laser electrode comprising:

diffusion bonding a first piece of a first material to a second piece of a second material utilizing a diffusion bonding catalyst between the first piece of material and the second piece of material during the diffusion bonding step; and,

machining the bonded pieces to form an electrode.

75. (Withdrawn) A method of forming bi-metallic fluorine gas discharge electrodes comprising:

diffusion bonding a first piece of a first material to a second piece of a second material utilizing an adhesion layer between the first piece of material and the second piece of material during the diffusion bonding step; and,

machining the bonded pieces to form an electrode.

76. (Withdrawn) A method of forming bi-metallic fluorine gas discharge laser electrodes comprising:

diffusion bonding a first piece of a first material to a second piece of a second material coating at least one of the surfaces to be bonded with an adhesion layer prior to the diffusion bonding step; and,

machining the bonded pieces to form an electrode.

77. (Withdrawn) The method of claim 67 further comprising:

roughing the surface of at least one of the pieces to be bonded prior to using the diffusion catalyst.

78. (Withdrawn) The Method of claim 68 further comprising:

roughing the surface of at least one of the pieces to be bonded prior to applying the adhesion coating.

(9)

Evidence Appendix

10/672,182

None.

(10)

Related Proceedings Appendix

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None.